examination twelve (23.5 per cent.) showed such an infection, and of the thirty-five cases in which focal nephritis was believed to be present eleven (31.4 per cent.) were heavily infected with this organism.

In fifty-seven cases albuminuria was first found at the third or fourth attendance—that is, from about the tenth to the twentieth day of the disease. In twenty-two of these patients (6.2 per cent.) more than a trace of albumin was present, and in five casts other than hyaline were found. In two of these latter confirmatory signs of diffuse glomerulo-nephritis were noted—in one oedema and in the other a transitory rise of blood pressure; in the three others no confirmatory signs of diffuse nephritis were present. In one of these an active infection (cervical adenitis with abscess formation) was present at the time when the albuminuria and casts appeared, and the patient was probably suffering from a focal nephritis. Adding the case of definite diffuse glomerulo-nephritis alluded to above—in which the albuminuria was detected on the eighth day of the infection—we have in all three undoubted cases of diffuse glomerulo-nephritis in our series of 354 patients suffering from tonsillitis: of these, two cleared rapidly under observation. Of the remaining twenty cases of late albuminuria ten are known to have cleared.

Of the twenty-two cases of late albuminuria nine (41 per cent.) showed a heavy haemolytic streptococcal infection, a figure rather above that of the whole series: of the three cases which we have regarded as suffering from diffuse glomerulo-nephritis only one showed such an infection.

It must be admitted that in the majority of our cases of late albuminuria the appearance of albumin in the urine remains completely unexplained.

To give one instance of this type of case, a female child, 6 years of age, was seen on the third day of the infection. The tonsils were engorged, but no exudate was present; no haemolytic streptococci were found in the throat swab. On the fourth day a slight follicular exudate was present; the urine was free from albumin. On the eleventh day the throat was clear and no albumin was present in the urine. On the eighteenth day, the throat still remaining clear, a considerable quantity of albumin appeared in the morning urine, but no casts or red blood cells were present in the centrifugized deposit. On the twenty-fifth day the urine was again completely clear. No oedema was noted at any time, and the child appeared to be in good health after she had recovered from the initial tonsillar infection. The albuminuria undoubtedly appeared at the time at which a nephritic lesion is to be expected, but in default of formed elements in the urine, and of other symptoms, a diagnosis of diffuse nephritis can scarcely be made.

The seasonal incidence of early and late albuminuria is shown in the following table, from which it is obvious that there is no relation between such variations of external temperature as our patients are exposed to at different times of the year and the frequency of albuminuria. The incidence of focal nephritis would appear to be somewhat higher during the winter months. Such a finding does not, of course, exclude the possible effect of extremes of temperature in the production of renal lesions, but merely indicates that such degrees of exposure as are met with in a city population are not an important factor in determining the appearance of albuminuria after tonsillitis.

	Total Cases	Early Albuminuria	Late Albuminuria	Focal Nephritis
July-Sept., 1932 ...	100	16 (16.0 %)	5 (5.0 %)	9 (9.0 %)
Oct.-Dec., 1932 ...	102	14 (13.7 %)	7 (6.8 %)	11 (10.7 %)
Jan.-Mar., 1933 ...	59	10 (16.9 %)	3 (5.1 %)	9 (15.2 %)
Apr.-July, 1933 ...	93	11 (11.8 %)	7 (7.5 %)	6 (6.4 %)

It may be mentioned that of our 354 patients thirty complained of "rheumatic" pains in the limbs after the tonsillitis had subsided. The patients thus affected were mainly young children, and frequently showed some degree of anaemia. The incidence of haemolytic streptococcal infection in these patients was 30 per cent., and corresponded therefore to the average for the whole series. In two cases chorea occurred, and in two erythema nodosum. No other complications were noted except the purely local, such as peritonsillar infiltration, cervical adenitis, and otitis media.

Conclusions

Of 354 cases of tonsillitis 14.4 per cent. showed definite early albuminuria and 6.2 per cent. late albuminuria.

From the urinary and clinical findings it would seem probable that focal nephritis occurred in thirty-five (10 per cent.) and diffuse glomerulo-nephritis in at least three (0.8 per cent.).

No correlation was found between predominance of haemolytic streptococci in the throat at the time of the acute infection and the incidence of focal nephritis.

Seasonal variations of external temperature did not appreciably affect the incidence of early or late albuminuria.

The incidence of predominant haemolytic streptococcal infection in the throat was not greater in those patients who afterwards complained of "rheumatic" pains than in the general series.

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SPIROCHAETAL JAUNDICE IN A LONDON SEWER WORKER CONFIRMED BY LABORATORY EXAMINATIONS

BY

E. A. M. HALSTED, M.B.

HOUSE-PHYSICIAN, UNIVERSITY COLLEGE HOSPITAL

In view of the number of cases of spirochaetal jaundice reported recently in sewer and canal workers, the following case occurring in a London sewer worker, fully confirmed by laboratory tests, may be of interest.

Case Record

The patient was a well-developed, unmarried man of 29, who had always worked as a labourer and bricklayer. Two months before the onset of his illness, for the first time in his life, he started to work in a London sewer, near the Elephant and Castle. There were no other sewer workers in the family. The duties consisted in carrying new bricks to men working on the wall of the sewer and carrying away the old ones which had been removed. The removed bricks frequently had a layer of slime on their surface, and the patient had to lift them by hand into a truck. Abrasions on the hands were frequent, but, on questioning, he stated that he had cut his hand more severely than usual approximately one week before the onset of the illness. He was taken ill on October 10th, 1934, and the subsequent course of the illness was as follows:

October 10th.—The onset was sudden, but the patient was able to work during the whole of the first day of the illness, and went to bed on the second. He had a severe headache and complained of pains all over, especially in the muscles and joints of all four limbs. He had a sore throat and sore eyes, and vomited everything for a week. In view of the sore throat he was believed to have diphtheria. A swab taken on October 12th was said to be positive, and he was sent to Acton Fever Hospital four days after the onset with this diagnosis.

October 14th.—On admission he looked and felt ill, and had haemorrhagic herpes of small extent. His throat was slightly infected, but there were no further signs of diphtheria. A further swab was taken, and found to be negative.

October 16th.—He became jaundiced for the first time, and his urine contained bile. The same day, the sixth after the onset of the disease, his general condition became much worse, and he was delirious. He remained delirious for three days, and also developed profuse epistaxis and melaena.

October 18th.—The general condition was worse; the patient was still bleeding from the nasopharynx and violently delirious, after an extremely restless night. The same afternoon he was given 10 c.cm. of anti-leptospiral serum.

October 19th.—On this date, after an illness of nine days, he was very much better; and, save for a slight recurrent epistaxis and the jaundice, all the symptoms had disappeared.

October 20th.—The patient was transferred to University College Hospital. On admission there was marked jaundice, but, although weak, he felt perfectly well again; there was no sign of haemorrhage anywhere. The liver was palpable, but not tender; the spleen was not palpable. On October 25th the urine contained a trace of albumin, occasional leucocytes and epithelial cells, and very occasional red cells and granular casts. The subsequent course showed progressive improvement without recrudescences, the jaundice fading in about a month, and the patient steadily gained in strength. A blood count had shown a moderate degree of secondary anaemia, presumably accounted for by the rather severe haemorrhages, but this rapidly disappeared with large doses of iron.

LABORATORY INVESTIGATION

October 19th.—Two guinea-pigs were scarified and inoculated with the patient's blood. Neither of these animals developed any signs of disease. This can probably be accounted for by the fact that it was necessary to transport the blood from Acton, and thus some time inevitably elapsed between the drawing of the blood and the inoculation.

October 26th and 31st.—The patient's serum gave a positive adhesion test to the human strain of leptospira. This was positive even in extreme dilutions.

October 26th, November 1st and 2nd.—On each of these three dates two guinea-pigs were inoculated with centrifuged urine deposits. In the centrifuged specimen on November 1st six motionless, apparently dead, leptospira were seen. In the specimen on November 2nd there were large numbers of apparently dead leptospira. Before the two latter specimens were collected the urine had been rendered alkaline by sodium bicarbonate and potassium citrate given by mouth, as the leptospira are said to retain their vitality better in an alkaline medium. After a period of nine days one of the guinea-pigs inoculated on November 2nd died, with all the signs of leptospiral jaundice, verified by post-mortem examination, and numerous living, actively motile, leptospira were seen on direct examination of the liver. From this source further inoculations were made, and the organism was grown in pure culture and proved to be a typical human strain of leptospira icterohaemorrhagica.

December 13th.—The urine was free from leptospira. Several specimens during the month of November had all contained the organism, which was identified by direct examination of centrifugized deposits.

The incubation period has been stated by Schuffner to vary between seven to thirteen days, so it is reasonable to suggest that the infection may have been due to the injury to the hand contracted a week before the onset. This is also suggested by the presence of slime on the old brickwork. Virulent leptospira have been discovered living saphrophytically in the slime on the walls of Scottish coal mines by Buchanan.

I am much indebted to Major H. C. Brown of the Wellcome Bureau, who very kindly carried out the pathological investigations, and to Dr. D. I. Thomas of the Acton Fever Hospital for the account of the progress of the case while under his care.

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SEPTICAEMIA DUE TO BRUCELLA ABORTUS FOLLOWING OPERATION

BY

L. S. POTTER, M.B., CH.B.

AND

N. HARBURN, M.B., CH.B.

Much interest has been apparent in the last few years in the occurrence of an increasing number of cases of undulant fever in this country. That this increase is a matter of fact and not surmise is shown by reference to recorded cases: whereas in 1928 these numbered five, in 1930 they were twenty-eight, and in 1932 no fewer than fifty-seven.¹ The case here recorded, besides possessing unique features, raises several points of great interest, and we feel that no apology is needed for presenting it in detail. For the sake of clarity it seems best to describe the events in sequence, and to reserve comment until afterwards.

Case Report

A married woman, who had not lived with her husband for some years, consulted one of us in November, 1933, complaining of "irregular and excessive periods." She stated that for the previous two months she had only had intervals of from three to five days without menstrual loss, that she felt rather weak and tired in consequence, and that she had occasional backache and a sense of weight and bearing down. She is a well-built woman, rather florid in complexion, and at that time was 35 years old and weighed a little under 10 st. The previous history contained nothing of importance. She had had three children in six years, the youngest being 7 years of age; the last two confinements she described as being rather slow and followed by prolonged bleeding, which kept her in bed for six or eight weeks. Menstruation had always been regular but rather excessive.

Examination confirmed a diagnosis of early prolapse, accompanied, and probably caused, by subinvolution, and expectant treatment with tonics, ergot, and tampons of glycerin and alum was persevered with for some weeks. Temporary improvement not being maintained, however, she was seen by Dr. J. W. A. Hunter of Manchester, who wrote confirming the diagnosis as follows:

The . . . vaginal walls are healthy but are definitely relaxed, and she has a fairly pronounced cystocele and a rather smaller rectocele. The cervix shows slight hypertrophy and is definitely lacerated and catarrhal, which would account for the long history of leucorrhoea. The uterus itself shows a fairly pronounced degree of subinvolution . . . she had a definitely prolonged puerperium after her last confinement and I think the subinvolution in all probability dates from this . . . there is some definite thickening in the left broad ligament between the ovary and the pelvic colon, probably as the result of a mild degree of infection from the colon. She suffers from some chronic left-sided pain, and this is accounted for by this condition. For treatment I would advise . . . a curettage to remove the thickened hypertrophied endometrium associated with the subinvolution in order to relieve her menorrhagia, a small amputation of the catarrhal cervix, and also an anterior and posterior colporrhaphy. . . .

Operation was performed as suggested by Dr. Hunter at the Buxton and District Hospital on June 13th, 1934, without incident, and recovery was rapid and uneventful until the eighth day, when the patient had a sudden haemorrhage. This was controlled by an injection of morphine, but recurred again at midnight the following night to a more alarming extent. As an injection of morphine failed to control the bleeding the vagina was packed with sterile gauze under light general anaesthesia, the pack being removed after fifteen hours. There was no further haemorrhage, but, as would be expected, there was a rise in temperature to 99.8°; this fell to normal the following morning.